# C-FERST: Community-Focused Exposure and Risk Screening Tool
# Questions & Answers



**Q: What is C-FERST?**

**A:** C-FERST (Community-Focused Exposure and Risk Screening Tool) is a GIS and resource access web tool for conducting cumulative human exposure and risk screening assessments, to help build sustainable and healthy communities[1]. It is designed to assist with identifying and prioritizing community environmental issues and to assess human exposures and health risks, using the best available information and science.

[1] The EPA's Community-Focused Exposure and Risk Screening Tool (C-FERST) and Its Potential Use for Environmental Justice Efforts. Zartarian VG, Schultz BD, Barzyk TM, Smuts M, Hammond DM, Medina-Vera M, Geller AM. Accepted for publication by the *American Journal of Public Health*.

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**Q: Who are the anticipated users of C-FERST?**

**A:** C-FERST is being developed and vetted in phases. Currently, C-FERST is most appropriate for EPA staff working with community groups to assess and address environmental risks in their communities. The prototype and initial development versions of C-FERST were previously circulated within EPA for comment by partners and potential users, and for use as a communication and research coordination tool. The C-FERST beta test version 1.0 is currently on the EPA Extranet, and is being tested and used by several pilot CARE program (Community Action for a Renewed Environment) communities and their EPA regional project officers.

Future C-FERST users could include other federal, state, or local agencies working with community partners as well as other community leaders and members, and individuals in the general public. C-FERST will be applied to support additional pilot communities seeking to identify and prioritize key environmental stressors. The tool will be refined and populated over time with additional information for community environmental issues, to foster broad application.

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**Q: Who is developing C-FERST?**

**A:** This tool is being developed by EPA scientific researchers in collaboration with EPA staff working extensively with community partners, including direct involvement of local partners such as several CARE (Community Action for a Renewed Environment) community partners.

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**Q: What is the anticipated impact of this tool?**

**A:** C-FERST is intended to assist communities with the challenge of identifying and prioritizing community environmental health issues. The primary impact of this research is anticipated to be use of C-FERST by regions and communities for making informed decisions for taking action to improve public health. C-FERST is expected to increase the quality and accessibility of science in environmental health decision-making.

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**Q: What is the need for C-FERST?**

**A:** C-FERST, and the research that it will incorporate, is a response to needs identified by the EPA CARE program, Office of Environmental Justice (OEJ), EPA regional offices, and communities themselves, as well as recommendations from the National Academy of Sciences,[1] National Academy of Public Administration,[2] EPA's Framework for Cumulative Risk Assessment,[3] and other Agency peer reviews. There are a large number of sources of pollution in communities across multiple environmental media. Communities and individuals want to identify and understand their environmental issues in the context of risk, but assessing health risks from multiple sources is challenging based on the current level of information available, and difficulties accessing, integrating, and interpreting data. Without easier access to information, community groups may miss relevant information when reaching conclusions about health risks. EPA is working to provide more options to communities with C-FERST, which is designed to support community partners making decisions to reduce pollution and minimize exposures.

[1]National Research Council, Science and Decisions: Advancing Risk Assessment, Washington, DC: National Academy of Sciences Press, chapters 7, 9 and elsewhere, 2008.

[2]NAPA (National Academy of Public Administration), Putting Community First: A Promising Approach to Federal Collaboration for Environmental Improvement: An Evaluation of the Community Action for a Renewed Environment (CARE) Demonstration Program, Washington, DC: National Academy of Public Administration, "Recommended Action 1" and others, 2009. http://www.napawash.org/wp-content/uploads/2009/09-06.pdf; accessed December 3, 2010.

[3]US EPA. Framework for Cumulative Risk Assessment. U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Washington Office, Washington, DC, EPA/630/P-02/001F. 2003.

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**Q: How Does C-FERST Support EPA's Research Goals?**

**A:** C-FERST supports EPA's priorities for cleaning up communities and working for environmental justice to protect vulnerable groups of people. C-FERST-related research supports the EPA's goal to provide tools to enhance community-based cumulative risk assessments. This research is in response to requests from EPA regions and local communities as well as in response to recommendations from the National Academy of Sciences, National Academy of Public Administration, EPA's Science Advisory Board, and other peer reviews.

The overall goal of ORD/NERL's communities research program is to develop, apply, and provide tools for advancing the science and understanding of cumulative risk to communities and individuals. These tools include information, strategies, exposure models, databases, sampling/analytical methods, GIS maps, and web applications. C-FERST is one of the primary research products under the ORD/NERL communities research program. It will link to and build upon other community-focused tools, and it will provide state-of-the-science approaches for characterizing community exposures to environmental contaminants that lead to cumulative risks.

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**Q: What can be learned or accessed using C-FERST?**

**A:** The C-FERST user is currently provided the following options:

- Use C-FERST following community guidance
- Consider/identify environmental issues for your community
- Access fact sheets for issues of concern
- Visualize exposure/risk-related maps (includes mapping local data)
- Generate environmental issue profiles
- Prioritize your community's issues (includes a community data table)
- Explore potential solutions
- Access additional tools for community assessments
- Provide feedback on C-FERST
- Learn about C-FERST

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**Q: What will be added to C-FERST in future versions?**

**A:** Future versions of C-FERST will incorporate additional features and research including:

- ongoing human exposure science (e.g., air toxics, radon, diesel exhaust, lead, environmental tobacco smoke, water pollution, fish consumption, residential pesticides, and cumulative risk estimates for lung cancer, asthma, and early neurotoxicity effects);
- collaboration/integration with ecological research;
- integration with other community-focused tools;
- more fully populated exposure/risk maps and environmental issue profiles;
- building capacity for more complete cumulative assessment and risk ranking;
- incorporation of EPA cumulative risk guidance and non-chemical stressors research;
- "what-if" scenarios for assessing impacts of community actions;
- incorporation of more sustainability aspects.

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**Q: What is unique about C-FERST?**

**A:** Assessing health risks from multiple sources is challenging, because of the current level of information available, and the difficulties inherent to accessing, integrating, and interpreting data. Other tools to support community assessments are available, but they are located in a number of different documents and websites, and technical assistance in identifying and using them varies across regions and communities. C-FERST organizes EPA information and science for community environmental issues in a user-friendly, comprehensive GIS and resource access web tool for conducting cumulative human exposure and risk screening assessments, to help build sustainable and healthy communities. Building on and linking to other tools, C-FERST is designed to assist communities identify and prioritize issues for taking action and to facilitate the use of science to enhance decision-making.

C-FERST provides a repository for communicating and showcasing EPA's best available information and exposure science. Specifically, it will provide guidance on collecting and mapping locally collected data; provide maps to help identify vulnerable populations and communities at risk; and eventually may enhance current issue-ranking approaches. It also provides a framework for collaborative research and information-sharing to support community assessments.

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**Q: What is the connection between C-FERST and the CDC/ATSDR – EPA Collaboration to Support Community-based Environmental Health Initiatives?**

**A:** C-FERST will be available from the EPA's Community Action for Environmental Public Health web page developed under this collaboration.

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**Q: How is C-FERST being developed?**

**A:** Initial C-FERST development was based on a review of tools for community risk assessments[1,2] as well as the draft 2006 document "EPA Community Screening of Environmental Risks: A Workbook for CARE Communities," developed by the EPA CARE program and Agency technical experts. For C-FERST scientific and usability aspects, EPA/ORD/NERL consulted with the EPA CARE Program, EPA Community-Based Technical Support Forum, and EPA Regional and Program Offices. A summary of this process and related research may be found in a recent publication by Zartarian and Schultz.[3] A prototype version of C-FERST was developed and presented at scientific conferences and community meetings, and incorporated feedback from partners and potential end users on both science and usability perspectives.

C-FERST continues to be developed and vetted in phases. Currently, it is being tested and used by several pilot CARE communities and their EPA regional project officers. Future C-FERST users could include other federal, state, or local agencies working with community partners as well as other community leaders and members, and individuals in the general public. C-FERST will be applied to support additional case studies in pilot communities seeking to identify and prioritize key chemical environmental stressors. The tool will be refined and populated over time based on these pilot studies, and with additional information for community environmental issues.

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[1] Barzyk T.M., Conlon K.C., Hammond D.M., Chahine T., Zartarian V.G., Schultz B.D., 2009. "Tools Available to Communities for Conducting Cumulative Exposure and Risk Assessments." *Journal of Exposure Science and Environmental Epidemiology*.

[2] Medina-Vera M., Van Emon J., Melnyk L., Bradham K., Harper S., Morgan J. 2009. "An Overview of Measurement Tools Available to Communities for Conducting Exposure and Cumulative Risk Assessments." *Journal of Exposure Science and Environmental Epidemiology*.

[3] Zartarian, V.G., and B. D. Schultz (2009), "The EPA's human exposure research program for assessing cumulative risk in communities," *Journal of Exposure Science and Environmental Epidemiology*.

**Q: How were environmental issues selected for inclusion in C-FERST?**

**A:** The list of initial environmental issues in C-FERST was based on a review of EPA and community documents (described in "Community Environmental Issues: A Summary and Analysis of Local and Federal Government Perspectives," Hammond, D., Lakin, M., Schultz, B., Zartarian, V. In Review). For the 2011 version of C-FERST, the list of issues included are based on chemical stressors identified in EPA risk ranking reports, the CARE program, and the Office of Environmental Justice. Future versions of C-FERST could include other issues identified through partner and end user feedback. They could also include information on chemical mixtures and the interactions and effects of risk modifying factors (e.g., "non-chemical" stressors such as noise and stress) on environmental stressors, based on ongoing and planned research.

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**Q: How will C-FERST address multiple environmental issues?**

**A:** While C-FERST is being designed as a comprehensive tool designed to be easy to use and transparent, it will contain exposure-based cumulative risk characterizations based on the best available information and science. Research to provide the scientific foundation for C-FERST is underway on assessing key exposure factors, data needs, and community exposure and risk characterization approaches for different environmental issues. It will incorporate research being conducted by EPA and others on chemical mixtures and the interactions and effects of risk modifying factors (e.g., "non-chemical" stressors such as noise and stress) on environmental stressors. This cumulative (i.e., multiple chemical) approach will be used to estimate exposures and risks for the different categories of issues in C-FERST: sources (e.g., diesel exhaust from traffic); individual toxic substances of concern (e.g., radon, ETS, benzene); and health effects (e.g., childhood asthma, lung cancer, and early neurotoxicity effects).

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**Q: How are C-FERST developers incorporating principles of sound science?**

**A:** The following principles are being used in C-FERST development:

- Provide the best science available on the covered topics;
- Engage the broader research community, including universities, other Federal agencies, states, and the international research community to fill the needs for scientifically sound information;
- Organize issues of interest to communities in the following categories: individual and cumulative sources; exposures to individual toxic agents; cumulative risks for health effects; and risk modifying factors;
- Provide information in a manner comparable to other issues in the same category;
- Provide information in a manner suitable for cumulative assessments, including toxic substance and non-toxic substance stressors;
- Partner with appropriate EPA Regions and Program Offices, and external groups on researching and communicating issues;
- Provide information on how Regions and communities may follow up with their own more-detailed analysis or data collection;
- Provide information on how to improve the health and well-being of the community in a sustainable manner;
- Develop clear criteria for inclusion of information in C-FERST;
- Provide tools for estimating or modeling the benefits or likely benefits of their risk reduction activities; and
- Provide a venue to better utilize the wisdom of the broader scientific community and public.

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**Q: What is the development status of C-FERST?**

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Future versions of C-FERST will incorporate additional features and research including: ongoing human exposure science; collaboration/integration with ecological research; integration with other tools; more fully populated exposure/risk maps and environmental issue profiles; building capacity for more complete cumulative assessment and risk ranking; incorporation of EPA cumulative risk guidance and non-chemical stressors research; "what-if" scenarios for assessing impacts of community actions; and incorporation of more sustainability aspects.

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**Q: How can I learn more about C-FERST?**

**A:** You may contact the following individuals for more information about C-FERST:

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